THE NATION'S LARDER IN WARTIME

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NATIONAL FOOD REQUIREMENTS

BY

Sir JOHN ORR, M.D., LL.D., F.R.S.

Director of the Rowett Research Institute, Aberdeen

The discovery about twenty-five years ago that a number of commonly occurring diseases, now known as deficiency diseases—of which rickets is an outstanding example in this country—are due to the lack of essential substances in the food (vitamins), and that lack of minerals might also be the cause of ill-health, marked the beginning of a new era in the science of nutrition. Energy-yielding foods such as bread are so abundant and cheap that in normal times there is little likelihood of people suffering from hunger. But the vitamin-rich and mineral-rich foods are still relatively expensive, and the results of dietary surveys show that many diets are deficient in these respects. In recent years, therefore, the tendency has been to emphasize the importance of food for health, and to assume that if the diet contains sufficient protective foods it is unlikely, in view of the cheapness of energy-yielding foods, to be short of calories. In the present discussion national requirements will be regarded from the standpoint of a diet adequate for the health of the population.

Our knowledge of dietary requirements is derived from deductions made from experiments on animals, from direct experiments on human beings, from clinical observations of patients suffering from deficiency disease, and, not least important, from dietary and clinical surveys in which health and physique of families or communities are compared with the kind of diet eaten.

From these data dietary standards have been drawn up. In 1933 the British Medical Association published a report giving examples of diets for families of different size and composition "at minimum cost." In the same year the Department of Home Economics of the United States Government issued what has become known as the Stiebeling standard, stating requirements in terms of constituents, and also in terms of foodstuffs which supply the different constituents in the necessary amounts. In 1935 an International Committee was appointed by the League of Nations to draw up dietary standards based on physiological needs. It confined itself to the needs of pregnant and nursing women, children, and adolescents.

[The lecturer here showed a table, "Average Requirements per Head of Population," in which these three standards were compared, adding that agreement between the standards was fairly close. They would doubtless be modified in the light of further knowledge, but meantime might be taken as yardsticks to give a rough measure of the adequacy of diets.]

Dietary Standards

Standards expressed in these technical terms, while essential for those engaged on research, convey little to the ordinary public. People think in terms of foodstuffs, and not in calories or other units. The following tables taken from the League of Nations report give an illustration of

the kind of diet which would supply sufficient amounts of all essential food constituents for the classes of persons specified:

<i>Pregnant or Nursing Woman</i>		<i>Child, 5-7 Years</i>	
Protective Foods :	Per Week	Protective Foods :	Per Week
Milk	12.3 pt.	Milk	12.3 pt.
Meat, etc. ..	29.6 oz.	Eggs	7
Eggs	7	Meat, fish, liver, or	7.4 oz.
Cheese	7.4 oz.	cheese	24.7 oz.
Green vegetables	24.7 oz.	Green vegetables	24.7 oz.
Potatoes	61.7 oz.	Potatoes	37.0 oz.
Legumes	2.5 oz.	Cod-liver oil ..	21 g.
Cod-liver oil ..	24.5 g.	Fruit	Not stated
Fruit	Not stated		
Energy-yielding Foods :		Energy-yielding Foods :	
Cereals	61.7 oz.	Fats (butter) ..	4.9 oz.
Fats and sugar ..	As needed	Cereals (bread) ..	24.7 oz.

The Canadian Medical Association has just issued a booklet entitled *Food for Health* which gives examples of diets for individuals and families of varying size and composition.

[The lecturer showed the Canadian Medical Association tables for a child and for a family.]

These diets are merely examples of the kind of diet which will provide a sufficient amount of all nutrients needed for health. An almost unlimited number of equally good diets could be drawn up with the protective foods in different proportions or with other foods not mentioned, but any diet fully adequate for health must contain the same high proportion of protective foods. The Advisory Committee on Nutrition, set up by the Government in 1931, has not issued any report giving examples of diets. It has, however, endorsed the League of Nations report and, as a first step towards bringing the national diet up to the standard for health, has strongly recommended that measures be taken to ensure that every child shall have at least one and a half pints of milk per day.

Diets in Common Use

[The lecturer showed the graphs overleaf, indicating the estimated average intake of two typical protective foods—namely, milk and vegetables—at different income levels.]

The consumption of protective foods falls as family income falls, because they are more expensive than the energy-yielding foods. This is shown in the following table:

Cost of 2,500 Calories (Prices : Aberdeen, January, 1940)

	s. d.		s. d.
White bread ..	4½	Cheese	1s. 6d. to 2s. 8d.*
Margarine (cheap) ..	4½	Milk	1 8
Sugar	6	Vegetables ..	2 7
Potatoes	6½	Eggs	5 1½
Meat	10d. to 3s.*	Fruit	5 5½

* According to quality.

Among the poorer half of the population protective foods are rationed by price. Consumption is determined by the ratio of retail price to purchasing power. A small rise or fall in the retail price of butter is accompanied by a corresponding decrease or increase in consumption. Even in the case of a relatively cheap food like potatoes consumption is affected by price. The difference in the amount of protective foods consumed by different classes is reflected in the composition and health value of their diets. Calories are cheap and, consequently, the calorie intake of all, except the very poor, is adequate. There is practically no starvation, or even hunger, in this country.

* The lectures will be published *in extenso* by Messrs. G. Bell and Sons, Ltd., of York House, Portugal Street, W.C.2.

The average protein intake of all classes is also up to requirements, save probably among pregnant and nursing women and young children of the poorest class.

The biggest difference between the diets of the poor and the well-to-do is in the intake of vitamins and minerals supplied by the protective foods. Among the poorest 10 per cent. of the population, according to estimates made from a dietary survey in 1937-9, the average intake per head of calcium is less than 0.5 gramme daily. It rises as purchasing power increases to over 1 gramme per head

of calcium has increased among the poorest section of the population by about 30 per cent. The great improvement in the national dietary had resulted in the almost complete disappearance of the grosser forms of deficiency diseases, such as rickets, scurvy, and xerophthalmia.

Before the outbreak of the war a similar improvement was taking place in most other countries. One of the tragedies of the war is that this world-wide movement is, for the time at least, likely to be retarded. It is almost inevitable that the war will bring about a deteriora-

VEGETABLES (Excluding Potatoes)

GRAPH 1.—Average intake of vegetables at different income levels.

among the wealthiest third of the nation. The main source of calcium is milk, and intake corresponds roughly with milk consumption. Vitamin A increases from about 2,000 international units among the poorest to about 4,800 among the well-to-do, vitamin B₁ from about 300 to about 630, and vitamin C from about 680 to about 1,700 per head daily.

Consumption of Protective Foods

In the last twenty-five years the average consumption of protective foods has increased by roughly about 50 per cent., resulting in an improvement in health and physique shown by the elimination of the grosser forms of deficiency disease, an increase in stature of adolescents, a fall in infant mortality rate of about 50 per cent., and a decrease of the death rate from tuberculosis. This improvement has gone on at an even faster rate during the last five or six years. Dietary surveys made between 1932 and 1936 indicated that the diet of nearly one-half of the population was not up to the Stiebeling standard, but another survey, made in 1937 and 1939, the results of which are not yet published, indicates that the proportion not up to standard has been reduced to one-third, and, what is equally important, that the deficiencies in the diet of the poorest are not as great as they were. The intake

MILK

GRAPH 2.—Average intake of milk at different income levels.

tion of the diet. Indeed, there is grave danger of shortage of food and actual starvation in widespread areas.

National Diet and the Present Emergency

Some may consider that in the present national emergency the health value of the national diet is of only secondary importance. On the contrary, the war has increased the necessity for ensuring that so far as possible the diet of the whole nation should be adequate for health. The issue may be decided on the home front, victory going to the nation which can show the greatest stamina and powers of endurance. Courage and powers of endurance depend to a large extent upon health and physical fitness, and all that we have learned in the last twenty-five years shows the overwhelming importance of food in relation to health. One aspect of this subject which is only beginning to be studied but which is of the utmost importance in war is the psychological effect of diet. It is doubtful whether any physical signs of malnutrition are unaccompanied by psychological signs. People suffering from malnutrition tend to be apathetic and despondent and, at times, hyperexcitable. Nervous debility and lethargy are characteristic of deficiency of vitamin B₁; early onset of fatigue and despondency are characteristic of nutritional anaemia.

We must not be content merely with trying to maintain the national dietary as near as possible to what it was in peacetime. It is as important to apply all our scientific knowledge to the improvement of the diet of the nation as to apply scientific knowledge to the improvement of weapons of war. The objective of war food policy should be, first, to supply sufficient of the protective foods for health, and then sufficient of the energy-yielding foods.

To meet national requirements on this basis we need to increase the supply of protective foods and also the total amount of food. The food requirements of the men who go into the fighting Services are increased by from 25 to 30 per cent. The same is true of the unemployed taken into the heavy industries. The total food requirements of the nation must therefore be increased by between 5 and 10 per cent.

Wartime Food Policy

This increase in supplies has to be met at a time when it is necessary to economize in shipping space and in foreign credits. In peacetime we produced at home what could not be imported cheaply, our imports amounting to about two-thirds of our total supply and requiring about 20 million tons of shipping per annum. In wartime our food policy must be based on home production. Our imports, apart from what we purchase for economic reasons or to keep the food out of the hands of the enemy, must be limited to what cannot conveniently be produced at home. Under these conditions we must be prepared for some change in the national dietary. We shall be fortunate if in the war and post-war period we can provide sufficient food to maintain the whole population in health, even though some of our likes and dislikes have to go by the board.

Fortunately it is possible to obtain all the nutrients which the body needs from a few foodstuffs. We should choose for increased home production those which are of the greatest value for health and, at the same time, yield the maximum amount of food per acre. In this category would come vegetables and potatoes. Of animal products the most important for health is milk. With a shortage of feeding-stuffs the dairy cow should have priority. If we had sufficient vegetables, potatoes, milk, and oatmeal we could meet national requirements for the protective foods. These, taken together in large amounts, would supply all the protein, vitamins, and minerals which the body needs.

Sufficient milk is being produced to provide 0.6 pint per head per day if it were all used in liquid form. The production of vegetables is being increased by allotment schemes, and could be increased sufficiently to bring consumption up to 6 oz. per head per day, the level among the wealthiest part of the population. Owing to the ease with which potatoes can be produced consumption might profitably be increased to 16 oz. per head per day. There is sufficient oats at peacetime level to provide 2 oz. per head per day, and still leave a considerable surplus for use as an animal feeding-stuff. The consumption of sugar might be reduced from its present level of 2.7 oz. per head per day to, say, 1 oz.

The following table shows the kind of diet which could be made up from the amounts of home-produced foodstuffs stated above and the peacetime average consumption of wheat and fats (butter, margarine, and cooking fats), the consumption of sugar being reduced to 2 oz. per head. In addition to the foodstuffs named there would always be home-produced beef, mutton, some eggs and bacon, and some imports of other foods, especially cheese and dried fruits.

	Calories	Proteins	Calcium	Iron	Vitamins (International Units)		
					A	B ₁	C
Protective : Milk .. 0.6 pt. Vegetables 6 oz. Potatoes 16 oz. Oatmeal 2 oz.	800	27	0.56	6	2,890	479	1,713
Energy-yielding : Bread .. 11.8 oz. Fats .. 1.8 oz. Sugar .. 1 oz.							
Total nutrients ..	2,100	50	0.67	13	3,500	646	1,713
Pre-war diet of poorest 10 per cent. ..	2,000	56	0.48	10	2,000	310	680

The above hypothetical diet is given not as a model which might be used as a basis for rationing but merely as an illustration of the fact that it is possible to make up a fairly satisfactory diet from a small number of foods, the most important of which can be produced at home in sufficient amounts. The difficulty is to ensure the equitable distribution of the food. We cannot get this by rationing unless the rationed amount is within the purchasing power of every family. The Government has allocated 50 million pounds a year to keep down food prices. But it is important to subsidize the right foods. A short list of home-produced and easily imported foods, such as that given above, from which a diet nearly adequate for health could be made up, would form a suitable iron ration which Mr. Keynes, for economic reasons, has suggested. If we had sufficient of these to meet the needs of the whole population, and at a price within the purchasing power of every family, the food position would be secure.

TREATMENT OF HEAD INJURIES IN WAR

BY

HUGH CAIRNS, D.M., F.R.C.S.

Nuffield Professor of Surgery, Oxford

The time is opportune to review the experiences of the belligerent nations in the treatment of head injuries of modern warfare. From both sides there come reports of operations which indicate that the principles of treatment are not sufficiently understood by all the civilian and Service doctors who are now called upon to care for head wounds of a type not encountered in civil life.

Wounds of the Brain

In the first stage of the war the open head wounds have been like those of the war of 1914-18, but both French and German authors^{1 2 3 4} have found that operation may be delayed longer than was previously thought safe, even up to forty-eight hours after the injury. In their view there is no call to operate before shock has been adequately treated, and, if the conditions of war are favourable, wounded may be transferred before operation to the C.C.S. or even the Base, as in the Polish campaign, where the Germans evacuated their wounded by air.⁵

All writers stress the importance of avoiding hasty and incomplete operations. Brain tissue resists and localizes bacterial infection as well as, if not better than, other tissues; it is the ventricular cavities and large basal cisterns that are so vulnerable to the spread of infection. In brain wounds, as in wounds of the limbs, it is desirable to remove necrotic tissue, bone splinters, and foreign bodies, with the object of preventing or restricting the spread of infection in the form of purulent encephalitis, abscess, purulent ventriculitis, and meningitis. The aim is to